

CLAIMS

What is claimed is:

1 1. A blast liner assembly for use in a solids placement tool within a wellbore, the blast liner
2 assembly comprising:

3 a) a tubular outer sleeve having a solids flow port therein and presenting a radially
4 interior blast liner retaining section;

5 b) a solids placement mandrel to be disposed radially within the outer mandrel, the
6 solids placement mandrel defining an interior solids flowbore and a solids exit port; and

7 c) a blast liner rotatably disposed within the blast liner retaining section of the outer
8 sleeve to lie radially outside of the solids placement mandrel, the blast liner comprising:

9 1) a generally cylindrical body having a longitudinal axis and defining an
10 interior flowspace with the solids placement mandrel; and

11 2) an angular flow diverter within the interior flowspace to impart a
12 rotational flow component to a flow of solids slurry through the interior flowspace, the blast liner
13 being rotated within the blast liner retaining section in response to the rotational flow component.

1 2. The blast liner assembly of claim 1 wherein the angular flow diverter comprises a
2 plurality of flow channels formed upon the body, flow channels being disposed upon the body at
3 an acute angle with respect to the axis of the blast liner body.

1 3. The blast liner assembly of claim 2 wherein the flow channels comprise a plurality of
2 inwardly projecting vanes.

1 4. The blast liner assembly of claim 2 wherein the flow channels comprise a plurality of
2 milled grooves in the body.

1 5. The blast liner assembly of claim 1 further comprising a rotational bearing disposed
2 between the blast liner and the outer sleeve.

1 6. The blast liner assembly of claim 1 further comprising a means for axially moving the
2 blast liner with respect to the outer sleeve.

1 7. The blast liner assembly of claim 6 wherein the means for axially moving the blast liner
2 comprises a progressively erodable bushing.

1 8. The blast liner assembly of claim 6 wherein the means for axially moving the blast liner
2 comprises a lug and track mechanism.

1 9. The blast liner assembly of claim 1 wherein the blast liner comprises an annular
2 reinforced impingement area upon an interior surface of the body.

1 10. A system for placement of solids within a wellbore comprising:

2 a) an extension sleeve assembly to be landed within a wellbore, the extension sleeve
3 comprising:

4 1) an outer sleeve having a solids flowport therein to be positioned for
5 disposal of a solid-containing slurry within a wellbore;

6 2) a blast liner rotatably retained within the outer sleeve, the blast liner
7 presenting a reinforced annular impingement area;

8 b) a service tool to be landed within the extension sleeve assembly, the service tool
9 comprising:

10 1) a solids placement tool defining a flowbore therewithin and a solids
11 flowspace between an outer surface of the solids placement tool and the blast liner; and

12 2) a solids exit port within the solids placement tool.

1 11. The system of claim 10 wherein the blast liner further comprises:

2 a tubular blast liner body having a longitudinal axis; and

3 an angular flow diverter having a plurality of flow channels formed upon the blast liner
4 body at an acute angle with respect to the axis of the blast liner body.

1 12. The system of claim 10 further comprising a progressively erodable bearing within the
2 outer sleeve abutting an axial end of the blast liner body, the erodable bearing being
3 progressively eroded upon rotation of the blast liner to permit the blast liner to move axially
4 within the outer sleeve.

1 13. The system of claim 10 further comprising:

2 a radially outwardly projecting lug upon an outer surface of the blast liner; and

3 a lug track inscribed within an inner surface of the outer sleeve to retain the lug such that
4 rotational movement of the blast liner within the outer sleeve results in the blast liner being
5 moved axially with respect to the outer sleeve.

1 14. The system of claim 13 wherein the lug track has a double-helical configuration.

1 15. A method for protecting portions of a solids placement system from erosion damage
2 comprising the steps of:
3 flowing a solids-containing slurry into a solids placement tool within a wellbore;
4 flowing the solids-containing slurry radially out of the solids placement tool, axially
5 along a flowspace defined between an outer surface of the solids placement tool and an inner
6 surface of a rotatable blast liner, and then radially outwardly through a solids exit port into the
7 wellbore;
8 rotating the blast liner with respect to the solids placement tool so as to provide an
9 increased particle impingement area to the slurry, thereby increasing blast liner life.

1 16. The method of claim 15 wherein the blast liner is rotated by angularly diverting slurry
2 passing axially through the blast liner.

1 17. The method of claim 15 further comprising the step of moving the blast liner axially with
2 respect to the solids placement tool so as to provide an increased particle impingement area to the
3 slurry, thereby increasing last liner life.

1 18. The method of claim 17 wherein the step of moving the blast liner axially comprises
2 eroding a member by rotation of the blast liner, said erosion permitting the blast liner to move
3 axially.

1 19. The method of claim 17 wherein the step of moving the blast liner axially comprises:
2 a) engaging a portion of the blast liner within a lug track within a liner retaining
3 section; and
4 b) rotating the blast liner so that said lug track engagement causes the blast liner to
5 be moved axially.

1 20. The method of claim 19 wherein the blast liner is moved in a double-helical fashion.